SOIL

INDEX

MOTORIZED LIQUID LIMIT DEVICE - CASAGRANDE APPARATUS (T-030/M)

ASTM D4318 • BS 1377 • AASHTO T89

- Equipped with a motor that perform the drop cycles automatically in a constant speed.
- Used to determine the moisture content at which soil pass from plastic to liquid state. This feature is very important in specifying the type of the soil, moreover, in determining the other parameters that relay on the soil type.
- Includes a cup that drops on a hard rubber base. It is also equipped with a drop counter.
- The grooving tool is supplied with the equipment (Testing standard is to be specified at the time of order).

Motorized Liquid Limit Device (T-030/M)

SUPPLIED WITH

- Blow Counter
- Grooving Tool (T-030/GT)

TECHNICAL SPECIFICATIONS

- Motorized
- Comprising of:
  - Hard rubber base
  - Brass cup
  - Cam mechanism
  - Blow counter
- Power Supply: 220 - 240 V / 50 or 60 Hz (110 V / 60 Hz is also available)

Code	Dimensions (± 1 cm)	Approximate Weight (kg)
T-030/M	26 x 16 x 13 (h)	3.1

LIQUID LIMIT DEVICE - CASAGRANDE APPARATUS (T-030)

ASTM D4318 • BS 1377 • AASHTO T89

- Used to determine the moisture content at which soil pass from plastic to liquid state. This feature is very important in specifying the type of the soil, moreover, in determining the other parameters that relay on the soil type.
- Includes a cup that drops on a hard rubber base. It is also equipped with a drop counter.
- The grooving tool is supplied with the equipment (Testing standard is to be specified at the time of order).

Liquid Limit Device (T-030)

SUPPLIED WITH

- Blow Counter
- Grooving Tool (T-030/GT)

Code	Dimensions (± 1 cm)	Approximate Weight (kg)
T-030	22 x 15 x 13 (h)	2.5

TECHNICAL SPECIFICATIONS

- Comprising of:
  - Hard rubber base
  - Brass cup
  - Cam mechanism
  - Blow counter

ASTM Grooving Tool (T-030/GT/ASTM)

AASHTO Grooving Tool (T-030/GT/AASHTO)

CONE PENETROMETER (T-090)

- Used to determine the moisture content while soil passing from plastic to liquid state by measuring the penetration of standard cone free falling into the soil under controlled conditions.
- Designed with auto-zeroing mechanism and a release button is equipped to the machine for easier using experience.

Digital Cone Penetrometer (T-090)

Semi-Automatic Digital Cone Penetrometer (T-090/SA)

T-090 Hand-operated model with a digital indicator to be used with a stopwatch.

T-090/SA Semi-Automated model with a digital indicator. It releases and stops the plunger automatically and shows the penetration measurements on a digital indicator.

SUPPLIED WITH

- Penetration Cone (T-090/PC)
  - Length: 35 mm
  - Angle: 30°
- Sample Cup (T-090/SC)

PLASTIC LIMIT SET (T-035)
ASTM D4318 • BS 1377-2 • AASHTO T-90

- Used to determine the plastic limit (lowest moisture content) at which a sample can be rolled into threads 3 mm diameter without breaking and/or cracking.
- Consists of a 300 x 300 mm glass plate, stainless steel rod, 6 pieces of moisture tins, mixing dish and a spatula.

Plastic Limit Set (T-035)

SUPPLIED WITH

- Stainless steel rod (Ø 3 mm)
- Glass plate (30x30 cm) (GL-38)
- Moisture tin (6 ea) (GL-20)
- Mixing dish (GPP)
- Spatula (GL-17)

SHRINKAGE LIMIT SET (T-037)
ASTM D427 • AASHTO T-92

- Used to determine the maximum amount of moisture in the sample at which the soil will not shrink while drying.
- Consists of crystallizing dish, shrinkage prong plate, evaporating dish, spatula and a graduated cylinder.

Shrinkage Limit Set (T-037)

SUPPLIED WITH

- Crystallizing Dish
- Shrinkage Prong Plate (w/ 3 Prongs)
- Evaporating Dish (GPP)
- Spatula (GL-17)
- Graduated Cylinder - 25 ml (GCM/0025)

POCKET PENETROMETER (T-304)

- Used to determine the classification of cohesive soil based on its consistency, shear strength and the approximate unconfined compressive strength.
- The range is (0 – 5) kgf/cm^2
- Equipped with a peak value indicator and supplied with a carrying case.

Pocket Penetrometer (T-304)

SUPPLIED WITH

- Case

Code	Dimensions (± 1 cm)	Approximate Weight (kg)
T-304	Dia: 2 / h: 17	0.2

TECHNICAL SPECIFICATIONS

- Range: 0-5 kgf / cm^2
- Peak Value Indicator

DIAL PENETROMETER (T-308)

- Used to determine the angle of friction, the cohesion index and the approximate unconfined compressive strength.
- Can be used on the foundation soil from clayey soil to sandy soil.
- The diameter of the dial is 60 mm, and equipped with a peak value holder.
- The Zero Setting for the equipment can be done by pushing the reset button.
- Consists of 5 different plungers to meet the required need, with diameters as follows:
  - 6.35 - 10 - 15 - 20 - 25 mm diameter

Dial Penetrometer (T-308)

TECHNICAL SPECIFICATIONS

- Dial Diameter : 60 mm
- Peak Value Holder
- Zero Setting by Push Button
- 5 Different Plungers:
  - 6.35-10-15-20-25 mm diameter

Code	Dimensions (± 1 cm)	Approximate Weight (kg)
T-308	7.0 x 14.5 x 3.5 (h)	0.2

SOIL PENETROMETER (T-310)

- Used to determine the relationship between the moisture content and penetration resistance of fine-grained soils.
- Consists of a special spring dynamometer with pressure indicating scale on the stem of the handle.
- The maximum pressure obtained by the test is indicated by the sliding ring on the steam.

Soil Penetrometer (T-310)

SUPPLIED WITH

- Carrying Case

HAND VANE TESTER (T-175)
ASTM D2573

- Used to determine the shear strength of the soil either in the laboratory or in the field (in-situ). It is very easy to use and gives the result directly in kPa.

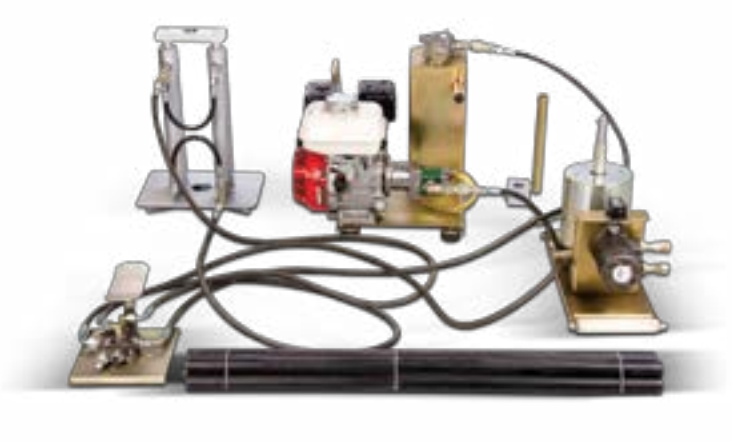
Hand Vane Tester (T-175)

TECHNICAL SPECIFICATIONS

- Can be used in the laboratory or in the field

LIGHTWEIGHT DYNAMIC PENETROMETER (T-300/LW)

- Used to determine the structural properties of the pavement, roads or any other existing construction areas with boundless materials.



Dynamic Penetrometer (T-300/LW)

SUPPLIED WITH

- Sounding rods - Ø 20 mm x 1 m (11 ea)
- Lifting device
- Grooved rod for sample extraction (1 ea)
- Hammer (10 kg) falling from 500 mm height
- Anvil
- Coupling
- Drive point 90° x 500 mm² (1 ea)
- Drive point 90° x 1000 mm² (1 ea)

TRL DYNAMIC PENETROMETER (T-300/TRL)

- Used to determine the structural strength of pavement layers in the field.

SUPPLIED WITH

- Hammer (8 kg) falling from 575 mm fixed height
- Driving rod (16 mm)
- Disposable cone tip (Ø 20 mm / 60°)
- Coupler assembly
- Carrying case

BALLOON DENSITY APPARATUS (T-067)

- Used to determine the inplace density and unit weight of compacted or firmly bonded soil.
- Suitable for use as a means of acceptance for compacted fill or embankments constructed of fine-grained soils or granular soils without appreciable amounts of rock or coarse material.
- Also may be used for the determination of the inplace density and unit weight of undisturbed or in situ soils, provided the soil will not deform under the pressures imposed during the test.

SUPPLIED WITH

- Rubber balloons
- Base plate

COMPACTION DETERMINATION APPARATUS (T-065)

- Used to determine the compaction percentage for the soil sample.
- Consists of a 12” diameter ring and supplied with complete accessories needed to perform the test.

Compaction Determination (T-065)

Code	Dimensions (± 1 cm)	Approximate Weight (kg)
T-065	41 x 31 x 25 (h)	8.0

SAND CONE SET (T-061)

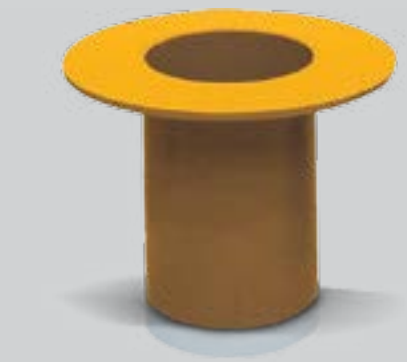
ASTM D1556 • AASHTO T-191

- Used to determine the in-situ density of the fine grain compacted soil. The test consists of making a hole in the compacted soil layer, filling it with known-density soil sample from the container (plastic jar/ sand pouring cylinder), then measuring the soil weight along with the water content.

- Contains a sand cone and a base plate that has an opening designed for the cone to sit into. The set also contains a container (plastic jar/sand pouring cylinder) to be used during the test.

CALIBRATION CONTAINER (T-061/x/CC)

- Used for taking reference measurement for the Sand Replacement test.



SAND CONE SET (T-061)

ASTM D1556 • AASHTO T-191

Sand Density Cone Set - Ø 6.5” (T-061/6)	Sand Replacement Set - Ø 200 mm (T-061/8)	Sand Density Cone Set - Ø 12” (T-061/12)
Sand Cone - Ø 6.5” (T-061/6/C)	Sand Cone - Ø 200 mm (T-061/8/C)	Sand Cone - Ø 12” (T-061/12/C)
Base Plate (T-061/6/BP)	Tray (T-061/8/BP)	Base Plate (T-061/12/BP)
Plastic Jar (T-061/6/PJ)	Sand Pouring Cylinder (T-061/8/SPC)	Sand Pouring Cylinder (T-061/12/SPC)
-	Calibration Container (T-061/8/CC)	-

STANDARD PROCTOR SET (T-050/S)

ASTM • BS • AASHTO

- Used to determine the relationship between the moisture content and the density for the compacted soil sample. Specifying this relationship will help detecting the optimum moisture contact of the compacted soil sample along with its maximum dry density.

Item	Standard Proctor Mould (ASTM)	Standard Proctor Rammer (ASTM)	Standard Proctor Mould (EN)	Standard Proctor Rammer (EN)	Standard Proctor Mould (BS)	Standard Proctor Rammer (BS)
Code	T-050/S-M/ASTM	T-050/S-R/ASTM	T-050/S-M/EN	T-050/S-R/EN	T-050/S-M/BS	T-050/S-R/BS
Diameter	4” (101.6 mm)	2” (50.8 mm)	100 mm	50 mm	105 mm	50 mm
Height (Drop)	4.584” (116.4 mm)	12” (304.8 mm)	120 mm	305 mm	115.5 mm	300 mm
Weight	-	5.5 lb (2.495 kg)	-	2.50 kg	-	2.50 kg

MODIFIED PROCTOR SET (T-050/M)

ASTM • BS • AASHTO

- Used to determine the relationship between the moisture content and the density for the compacted soil sample. Specifying this relationship will help detecting the optimum moisture contact of the compacted soil sample along with its maximum dry density.

Item	Modified Proctor Mould (ASTM)	Modified Proctor Rammer (ASTM)	Modified Proctor Mould (EN)	Modified Proctor Rammer (EN)	Modified Proctor Mould (BS)	Modified Proctor Rammer (BS)
Code	T-050/M-M/ASTM	T-050/M-R/ASTM	T-050/M-M/EN	T-050/M-R/EN	T-050/M-M/BS	T-050/M-R/BS
Diameter	6” (152.4 mm)	2” (50.8 mm)	150 mm	50 mm	N/A	50 mm
Height (Drop)	4.584” (116.4 mm)	18” (457.2 mm)	120 mm	457 mm	N/A	450 mm
Weight	-	10 lb (4.5364 kg)	-	4.50 kg	N/A	4.50 kg

AUTOMATIC SOIL COMPACTOR (T-055)

ASTM • BS • AASHTO

- Used to determine the relationship between molding water content and dry unit weight of soil.
- Specifying this relationship will help detecting the optimum moisture contact of the compacted soil sample along with its maximum dry density.
- Can perform both standard and modified compactions on soil samples assuring uniform and precise practice.
- Safety transparent door eliminates risks and allows observation.
- Equipped with automatic digital counter which stops at the required number of blows.
- The compactor can be used to compact samples in both standard and modified proctor moulds.

Automatic Soil Compactor (T-055)

	Item	Automatic Proctor (ASTM)	Automatic Proctor (EN)
Standard	Diameter	2” (50.8 mm)	50 mm
	Drop Height	12” (304.8 mm)	305 mm
	Weight	5.5 lb (2.495 kg)	2.50 kg
Modified	Diameter	Circular: 2” (50.8 mm) Sector: 2.9” (73.7 mm)	50 mm
	Drop Height	18” (457.2 mm)	457 mm
	Weight	10 lb (4.5364 kg)	4.50 kg

MOISTURE / TEMPERATURE TESTER (T-462)

- Used to determine the moisture percentage and the temperature of the soil samples and the fine aggregates with maximum particle diameter of 10 mm.
- It measures upto 1000 mm depth.
- The range of the moisture content that can be detected by the equipment is between 0% (Dry condition) to 35% with sensitivity of (0.5%).
- The temperature ranges between (-20°C) to (+60°C) with reading sensitivity of 0.5°C.

TECHNICAL SPECIFICATIONS

- Specially for Sand, Aggregate
- Depth: 1 m Depth
- Moisture: 0-35% (0.5 %)
- Temperature : -20 / +60 (0.5°C)

WATER LEVEL INDICATOR (T-470)

- Used for determining the level of water in boreholes, wells or any other ground opening.
- Pilot lamp is activated when the probe touches the surface of the water.
- Custom length can be manufactured upon request.

Water Level Indicator (T-470)

AVAILABLE MODELS

- Length: 50 m (T-470/050)
- Length: 100 m (T-470/100)
- Length: 200 m (T-470/200)

UNIVERSAL CARBIDE TESTER (Speedy Mositure Tester) (T-068)

- Used to determine the moisture in the soil, sand and aggregate particles. The machine gives quick and accurate results. The tester is suitable for both lab and field work.
- The mechanism carried out by the machine is through measuring the gas emission from the reaction between water and calcium carbide.
- The tester is equipped with a portable electronic balance, steel balls and a carrying case.

SUPPLIED WITH

- Calibrated Pressure Bottle
- Moisture Meter
- Precise Digital Scale
- Spherical balls
- Sample Cups (2 ea)
- Hammer
- Chisel
- Sampling Spoon
- Sample Grinding Bowl
- Set of 25 ampoules of Calcium Carbide
- Digital Timer/Stopwatch
- Calibration set
- Cleaning Brush
- Carrying Case


HS-5001EZ

NUCLEAR DENSITY / MOISTURE GAUGE (EZ-121)

- Used to determine density and the moisture content of the sample in a very short period with very accurate results.
- The testing time can be chosen from the control panel as 15 seconds, 1 minute and 4 minutes.
- The depth range that can be measured by this equipment is 12” (30 cm), with 1” measurement increment.
- Supplied with all the necessary accessories to perform the test.

Nuclear Density / Moisture Gauge (EZ-121)

TECHNICAL SPECIFICATIONS

- Used for rapid fiend tests.
- Test time: 15 sec / 1 min / 4 min
- Depth Range up to 12” (30 cm)
- Increment: 1” (2.5 cm)
- With Accessories

Code	Dimensions (± 1 cm)	Approximate Weight (kg)
EZ-121	Gauge : 40 x 22 x 14 (h) Reference Standard : 35 x 20 x 8 (h) Transit Case : 79 x 36 x 50 (h) Accessory Case : 50 x 25 x 13 (h)	41

ELECTRICAL DENSITY GAUGE (EDG)
ASTM D7698

- The Electrical Density Gauge (EDG) is a nuclear-free alternative for determining the moisture and density of compacted soils used in road beds and foundations.
- The EDG is a portable, battery-powered instrument capable of being used anywhere without the concerns and regulations associated with nuclear safety.
- Its user-friendly, step-by-step menu guides the user through each step of the testing procedure and cautions the user when values do not correspond to established curves for the material being tested.
- Easy-to-use, the EDG can be used as a construction aid to monitor day-to-day compaction operations by providing performance and measurement results highly comparable to those achieved with traditional methods, including the nuclear gauge and/or a sand-cone and oven moisture test combination.
- When conducting a test, the EDG measures and displays the results for wet and dry density, gravimetric moisture content and percent compaction.

Electrical Density Gauge (EDG)

TECHNICAL SPECIFICATIONS

- Portable, battery powered.
- Step-by-step menu guide throughout the test.
- Power: Li-ion Battery

Code	Dimensions (± 1 cm)	Approximate Weight (kg)
EDG	53 x 43 x 20 (h)	7

LABORATORY CBR TESTER - LCD (T-001/LCD)

ASTM 1883 • BS 1377:4 • EN 13286:47

- The California Bearing Ratio (CBR) is a penetration test carried out to evaluate the mechanical strength of road subgrades and base-coarse layers.
- Equipped with an LCD Data Acquisition System to view/perform the test and show the CBR index automatically upon finishing the test.
- Has a capacity of 50 kN and automatically performs the test, with an automatic stop after finishing the test and returning to initial position.
- The LCD screen shows the Loading versus Penetration in a real time graph during the test.
- Equipped with output port to RS 232 or normal printer.
- Equipped with a memory that has the ability to save 1000 test results. Old test results can be recalled and observed on the LCD monitor.

SUPPLIED WITH

- Load cell: 50 kN cap
- Penetration Piston

TECHNICAL SPECIFICATIONS

- Capacity: 50 kN
- Graphical LCD Data Acquisition system
- Two loading rate: (1 mm/min) and (1.27 mm/min)
- Automatic stop when test complete
- Loading vs. Penetration is shown graphically
- CBR index is given automatically
- RS 232 or output to printer is available
- 1000 test data can be stored
- Old tests can be recalled
- Power Supply: 220 - 240 V / 50 or 60 Hz (110 V / 60 Hz is also available)

Laboratory CBR Tester (T-001/LCD)

Code	Dimensions (± 1 cm)	Approximate Weight (kg)
T-001/LCD	42 x 75 x 100 (h)	110

FIELD CBR TESTER (T-005)
ASTM 1883 • BS 1377:7 • AASHTO T-193

- The California Bearing Ratio (CBR) is a penetration test carried out to evaluate the mechanical strength of road subgrades and base-coarse layers.
- Designed with a capacity of 50 kN and suitable for field works.
- Equipped with a mechanical jack (2-speed), and a load ring.
- Includes a penetration piston specially designed for CBR Apparatus, penetration dial (2 pieces), dial holder, extension rods and a surcharge weight.

Field CBR Tester (T-005)

TECHNICAL SPECIFICATIONS

- Capacity : 50 kN
- Mechanical Jack - 2 Speed
- Load Ring
- Set Includes:
  - CBR Penetration Piston
  - Penetration Dial (2ea)
  - Dial Holder
  - Extension Rods
  - Surcharge Weight

CONVERSION FRAME FOR FIELD CBR TESTER (T-005/LF)
ASTM 1883 • BS 1377:4 • EN 13286:47

- This frame cannot be used alone, the frame is used to convert the field CBR (T-005) in order to use it in the laboratory.

Field CBR (T-005) with Conversion Frame (T-005/LF)

LABORATORY CBR TESTER - DIGITAL (T-001/D)

ASTM 1883 • BS 1377:4 • EN 13286:47

- The California Bearing Ratio (CBR) is a penetration test for evaluation of the mechanical strength of road subgrades and base-courses.
- Has a capacity of (50 kN) and the machine is suitable to be used in laboratories.
- Equipped with a digital load indicator.
- Supplied with a CBR penetration piston and a penetration dial.

Laboratory CBR Tester - Digital (T-001/D)

TECHNICAL SPECIFICATIONS

- Lab Type - Digital
- Capacity : 50 kN
- Load Indicator : Digital Load Cell
- Power Supply: 220 - 240 V / 50 or 60 Hz (110 V / 60 Hz is also available)

SUPPLIED WITH

- Penetration Piston
- Dial Indicator for Penetration (25 mm / 0.01 mm)

Code	Dimensions (± 1 cm)	Approximate Weight (kg)
T-001/D	42 x 70 x 100 (h)	110

CBR EQUIPMENT (T-01x)

TECHNICAL SPECIFICATIONS

Code	Item	ASTM (T-01x/ASTM)	BS (T-01x/BS)	EN (T-01x/EN)
T-010	CBR Mould	Ø 6" x 7"	Ø 152 mm x 127 mm	Ø 150 mm x 120 mm
T-011	Solid Base Plate	Solid	Solid	Solid
T-012	Perforated Base Plate	Perforated	Perforated	Perforated
T-013	Spacer Disc with T-Handle	Ø 5 15/16" x 2.416"	Ø 150 mm x 50 mm	Ø 149.5 mm x 36 mm
T-014	Slotted Surcharge Weight	5 lb (2270 g)	N/A	N/A
T-014	Split Surcharge Weight	N/A	2000 g	2000 g
T-015	Annular Surcharge Weight	5 lb (2270 g)	2000 g	2000 g
T-016	Swell Plate with Stem	Steel	Steel	Steel
T-017	Tripod	Cast Iron	Cast Iron	Cast Iron
T-018	Dial Indicator	10 / 0.01 mm	25 / 0.01 mm	10 / 0.01 mm
T-019	Soaking Tank	Plastic	Plastic	Plastic

SAMPLE EXTRUDER (T-020)

- Used to extract the sample from its mould. It can be used with proctor test moulds, CBR test moulds, Marshall test moulds and other moulds having the diameter 100 mm/4” to 150 mm / 6”.
- The machine is actuated using a manual hydraulic jack.

Sample Extruder (T-020)

TECHNICAL SPECIFICATIONS

- Manual-Hydraulic Type
- Used for 100 mm /4” to 150 mm / 6” diameter samples
- Can be used with Proctor, CBR, Marshall moulds

Code	Dimensions (± 1 cm)	Approximate Weight (kg)
T-020	Dia: 30 / h: 60	35

UNIVERSAL EXTRUDER (T-025)

- Used to extract the sample out of Shelby moulds, proctor moulds and CBR moulds.
- Controlled by a hydraulic jack having 400 mm stroke.
- Supplied with all the needed adaptors to meet the need of the user, to be specified at the time of inquiry.

Universal Extruder (T-025)

Universal Extruder (T-025)

TECHNICAL SPECIFICATIONS

- Used for:
  - Shelby, proctor moulds, CBR mould
  - Piston stroke 400 mm
  - Supplied with adaptors

CONSTANT HEAD PERMEABILITY SET (T-250/CH)

- Used to determine the permeability of granular-grained soils
- Consists of:
  - Permeameter stand
  - Constant-head permeability cell
  - Manometer tubes/valves
  - Constant-head tank

TECHNICAL SPECIFICATIONS

- Permeameter Stand with 3 tubes
- Constant-head permeability cell - Ø 75 mm (1 ea)

FALLING HEAD PERMEABILITY SET (T-250/FH)

- Used to determine the permeability of fine-grained soils
- Consists of:
  - Permeameter stand
  - Constant-head permeability cell
  - Manometer tubes/valves
  - Constant-head tank

TECHNICAL SPECIFICATIONS

- Permeameter Stand with 3 tubes
- Constant-head permeability cell - Ø 114 mm (1 ea)

DIGITAL PLATE LOAD SET (T-063/D)

ASTM D1194 • ASTM D1195 • BS 1377:9

- Used to determine the bearing capacity of soil layers in road constructions, foundations, highways, airport and subgrades and sub-layers of soil.

- Includes a hydraulic loading device, digital indicator, a manual pump, datum bar, dial holder and two dials each with sensitivity of 0.01 mm.

- Also includes two pieces of circular plates, having diameters of 300 mm and 450 mm.

Digital Plate Load Set (T-063/D)

TECHNICAL SPECIFICATIONS

- Hydraulic loading
- Capacity : 100 kN
- Equipped with digital manometer

SUPPLIED WITH

- Ø 300 mm bearing plate
- Ø 450 mm bearing plate
- Datum bar
- Dial holder (3 ea)
- Dial 50 / 0.01 mm (3 ea)

OEDOMETER - CONSOLIDATION (T-210)

ASTM D2435 • BS 1377-6

- Used to determine the behavior of the soil sample upon certain loading in a specified period of time. It indicates the settlement characteristics of the soil which is known as Consolidation.
- The loading ratio for the device is 10:1 and designed as front loading type. The rear weight is used for balancing the device.
- The device has a support for a screw jack and supplied with a dial and its holder, consolidation cell, two porous discs and weight set.
- Fixed on a frame and can be ordered as 1, 2 or 3 devices on the same frame.

SUPPLIED WITH

- Dial Indicator : 12.7 / 0.002 mm
- Dial Holder
- Consolidation Cell
- Porous Discs (2 ea)
- Weight Set (4 x 10 kg, 1 x 5 kg, 1 x 2 kg, 2 x 1 kg, 1 x 0.5 kg, 2 x 0.25 kg)

Code	Dimensions (± 1 cm)	Approximate Weight (kg)
T-210/1	50 x 80 x 135 (h)	84
T-210/2	90 x 80 x 135 (h)	163
T-210/3	130 x 80 x 135 (h)	242

TECHNICAL SPECIFICATIONS

- Front Loading Type
- Load Ratio = 10:1
- Rear Balancing Weight
- Screw Jack Support
- Oedometers can be ordered as one (T-063/1), two (T-063/2) or three (T-063/3) devices on the same frame.

UNIAXIAL TESTER (T-201/D)

- The test is also known as “Unconfined Compression Strength Test (UCS)”.
- Used to determine the material behavior and characteristics under axial loading up to failure point. It can also determines the local deformation of the soil sample upon loading.
- Has a capacity of 50 kN and equipped with a load cell and digital indicator.
- The digital indicator has a “Peak Hold” function that shows the maximum load.

Uniaxial Tester (T-201/D)

TECHNICAL SPECIFICATIONS

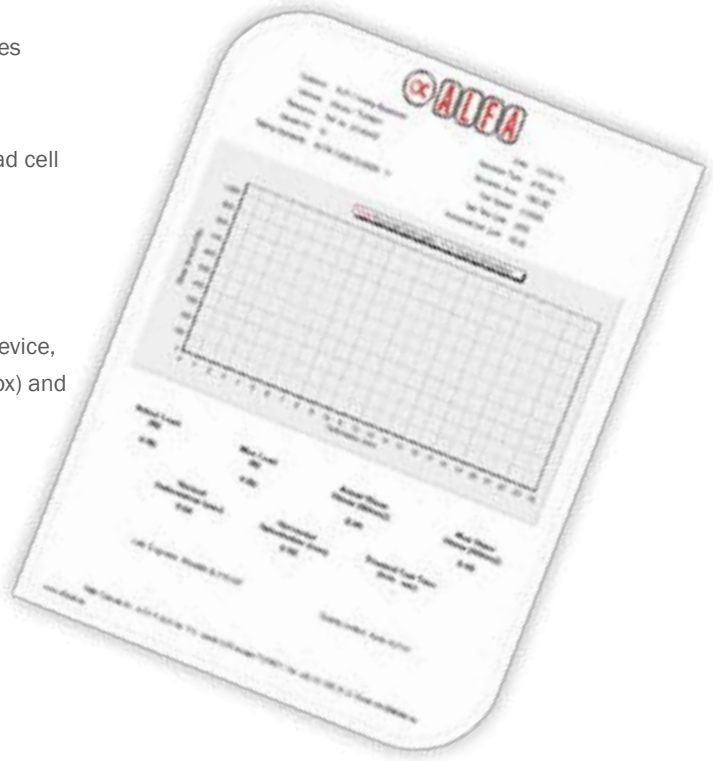
- Capacity : 50 kN
- Load Cell & Digital Indicator
- “Peak Hold” function for max. Load
- Power Supply: 220 - 240 V / 50 or 60 Hz (110 V / 60 Hz is also available)

Code	Dimensions (± 1 cm)	Approximate Weight (kg)
T-201/D	50 x 90 x 115 (h)	120

DIRECT SHEAR TESTER (T-220)

ASTM D3080 • BS 1377-7

- Used to determine the resistance of soil against shear forces applied on it.
- The device is equipped with a KIOSK type touch screen, load cell with a capacity of 5 kN.
- The loading speed varies from 9 – 0.00001 mm/min.
- Supplied with vertical and horizontal dials, beam loading device, shear box (either 60 mm diameter or 60x60 mm square box) and weight set.



DIRECT SHEAR TESTER (T-220)

ASTM D3080 • BS 1377-7

SUPPLIED WITH

- Software
- Electronic Deformation Sensor (Vertical and Horizontal)
- Beam Loading Arm
- Shear Box 60 mm dia. or 60 mm square (To be specified at the time of order)
- Weight Set (4 x 10 kg, 1 x 5 kg, 1 x 2 kg, 2 x 1 kg, 1 x 0.5 kg, 2 x 0.25 kg)

TECHNICAL SPECIFICATIONS

- LCD Graphical System
- Shear force measurement by Load Cell
- Maximum Shear Force: 5000 N
- Maximum Vertical Load: 500 N / 5000 N (using 10:1 loading arm)
- Speed Range: 0.00001 - 5.00000 mm/min
- Power Supply: 220 - 240 V / 50 or 60 Hz (110 V / 60 Hz is also available)


ALFA
www.alfalab.eu

FULLY AUTOMATIC TRIAXIAL TESTER (T-5001/A)

ASTM D2850 • D4767 • D7181

- Used to perform large range of Triaxial tests on soil samples to determine the strength parameters and the mechanical properties.
- Capable of performing:
  - Standard Triaxial Tests:
    - UU Test (Unconsolidated Undrained Test)
    - CU Test (Isotropically Consolidated Undrained Test)
    - CD Test (Isotropically Consolidated Drained Test)
  - Wide range of advanced Triaxial tests (ie, K_0 consolidation, custom stress paths, extension tests ... etc)
- Capacity:
  - Frame : 200 kN (20 tons)
  - Load Cell : 20 kN (2 tons)
  - Cell : 2000 kPa
  - Pressure Transducer : 25 bar
  - Water Tank : > 30 lt
  - Ram travel : 50 mm
- Sample Dimensions
  - Triaxial Tests : 35 – 70 mm
  - Flexible Wall Permeability : 35 – 90 mm
- The load cell is installed inside the cell to eliminate the piston friction calculations from the test and provide very precise measurements, which is directly applied on the sample. The water-proof load cell is made completely of stainless steel.

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- The load is applied by servo-motor, which allows sensitive control on loading speed ranging from 0.00001 – 9.99999 mm/min.
- The cell is made of high-strength plexiglass specially designed for this particular device with thickness of 10 mm.
- Equipped with 2 PVAs (Pressure-Volume Actuator) which controls and measures both pressure change volume change in the cell and the sample. The PVA is completely controlled from computer with the supplied software.
- The pressure is measured using very precise pressure transducer that sends the data to the equipped acquisition system.
- The acquisition system gathers the data from all the sensors (load cell, pressure transducers, electronic position indicators ... etc), analyses it and sends it to the computer via USB.
- The water tank is fitted with a magnetic stirrer to de-air the water before pumping it into the system. Adding this feature significantly reduces the time required to saturate the sample and provide air-free water during the test to the whole system.
- The LCD indicator at the front of the system shows the readings from all the sensors and the position of the PVA pistons with the amount of water left in each one simultaneously.
- The tests are all performed from computer with the help of ALFA's state-of-the-art Triaxial Control software (refer to appendix A for more details).
- The device is supplied with all the required accessories to perform Triaxial Tests, Uniaxial UCS Tests, Permeability Tests, and all the tools for proper sample preparation.

SUPPLIED WITH

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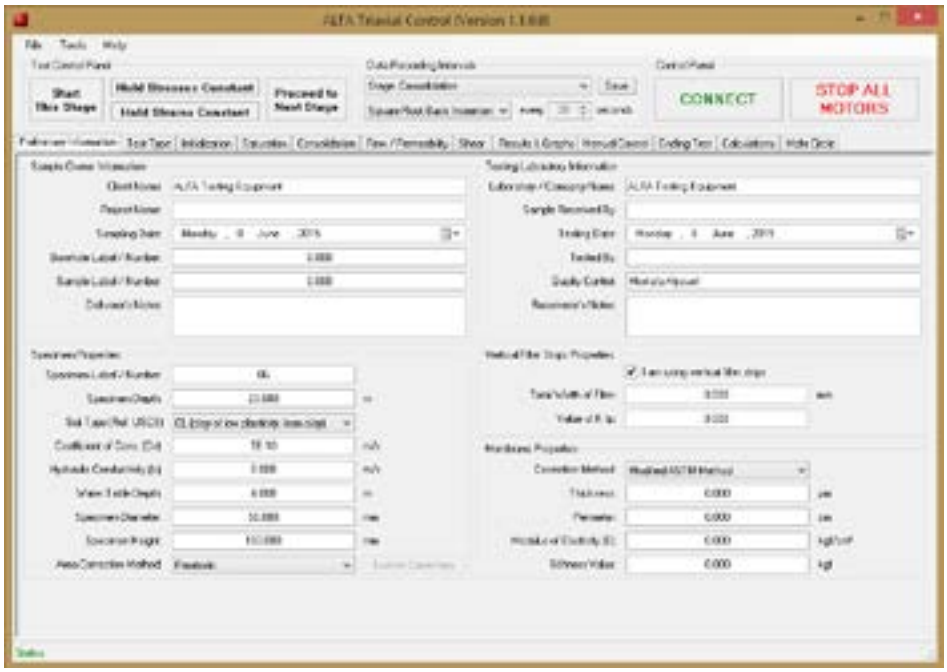
TRIAXIAL SOFTWARE



- The software provides full control on ALFA's Triaxial Tester (T-5001/A). It consists of different tabs with self-explanatory notes and guides taken from the international standards and based on the findings of reliable researchers and universities in the world.
- Each tab guides the user to what should be done in very simple step-by-step progress. The top part of the software is constant that provides quick access to some important control functions on the software and the machine like proceeding to next stage, changing the data recording method for the report, emergency stop for the machine ... etc.

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TRIAXIAL SOFTWARE

File Menu		
• Start New Test	Used to start new test from beginning	
• Continue Old Test	Used to continue an old test and merge the data of sets together for comparison	
• Save	Saves the current test	
• Save As	Saves the current test to different file	
• Reporting	Adjust the report settings and what to include in it	
• Data Export	Export the data to third-party applications like Excel	
• Exit	Closes the software	
Tools Menu		
• Preferences	Adjust test preferences like units, connections ... etc	
• Calibration	Perform / check the sensors' calibration	
• LCD Monitor	Turn ON and OFF the LCD monitor	
Help Menu		
• Check for Updates	Check if there is any update available for the software (requires internet connection)	
• User Manual	Views the user manual	
• About	Gives information about the software and its version	

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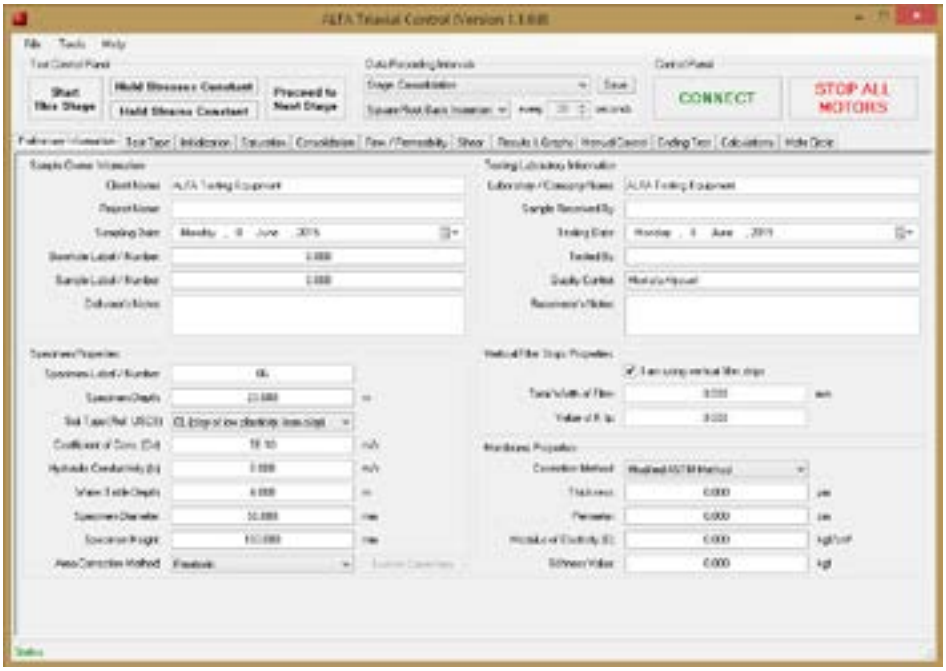
TRIAXIAL SOFTWARE : Preliminary Information Tab



Sample Owner Information:

- To be filled with the sample owner's information. These information are used in the final report.

Testing Laboratory Information:

- To be filled with the testing laboratory or institute's information. These information are used in the final report.

Specimen Properties:

- Specimen number, depth, coefficient of consolidation, water table, soil type, diameter, height, area correction method ... etc are all selected and specified from this section. These information are crucial and to be used in further calculations and to decide the behavior of the equipment based on the sample properties.

Vertical Strips:

- Specifying whether the vertical strips are used or not, with its properties.

Membrane Properties:

- Specify the correction method for the membrane and specify is properties.

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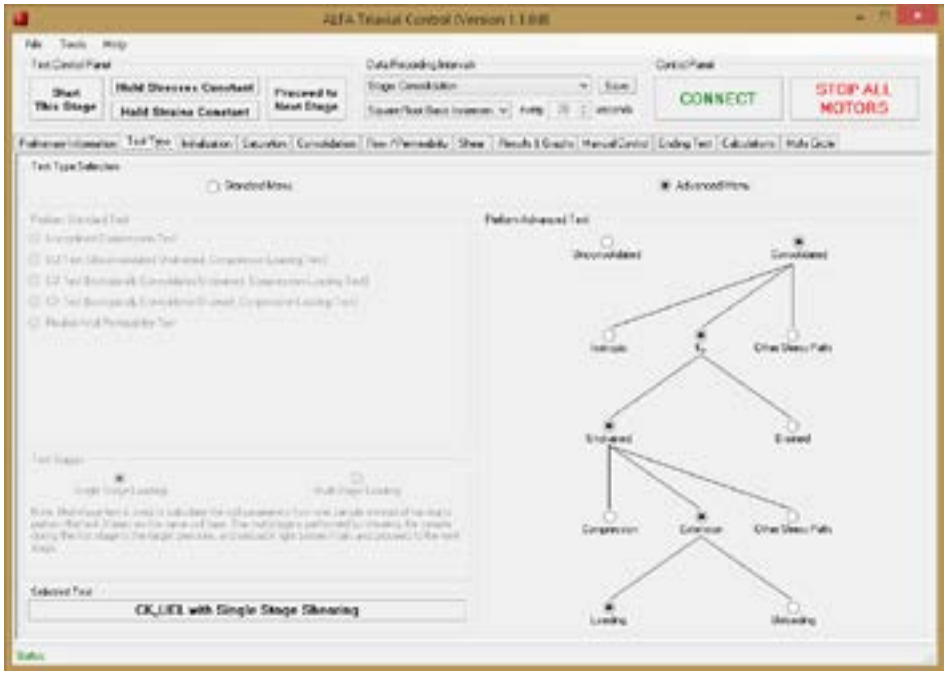
TRIAXIAL SOFTWARE : Test Type Tab



Test Type Selection:

- Select whether to have simplified menu (for standard tests) or advanced menu (for custom tests).

Perform Standard Test:

- Choose the test type from simplified selections.

Perform Advanced Test:

- Choose the test from stage-by-stage selection. This option gives the ability to perform any custom test on the sample from very wide range of functions based on international standards and findings of reliable researchers and institutes.

Test Stages:

- Select between single-stage or multi-stage tests. This option gives the ability to obtain 3 mohr circles and determine the strength parameters from a single Triaxial soil sample.

Selected Test:

- Displays the chosen test type.

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TRIAXIAL SOFTWARE : Initialization Tab

Proper Flushing Instructions:

- Some instructions to perform proper flushing for the setup to avoid having air bubbles left over.

Initial Readings / Positions:

- Shows and controls the initial positions of each piston/motor to avoid over-travelling or running out of water during the test.

Vacuum Application:

- Gives the ability to include the vacuum calculations to the software if applied (used for sand samples).

Stage Automation Control:

- Gives the option to select which stage to start automatically.

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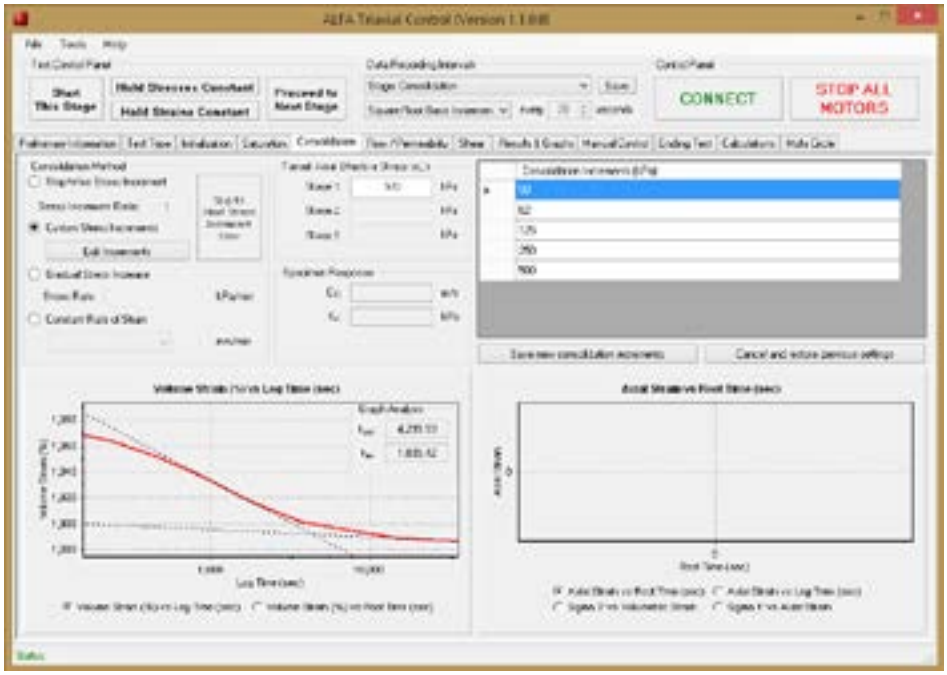
TRIAXIAL SOFTWARE : Consolidation Tab



Consolidation Method:

- Gives the ability to select which method to follow in order to consolidate the sample.

Target Pressures:

- Gives the option to target 3 consolidation pressures in multi-stage mode to obtain the strength parameters from single sample.

Specimen Response:

- Shows the consolidation value and the K0 value.

Graphs:

- Axial Strain vs σ1
- σ3 vs σ1
- Volumetric strain vs time (for t50 and t100 calculations)

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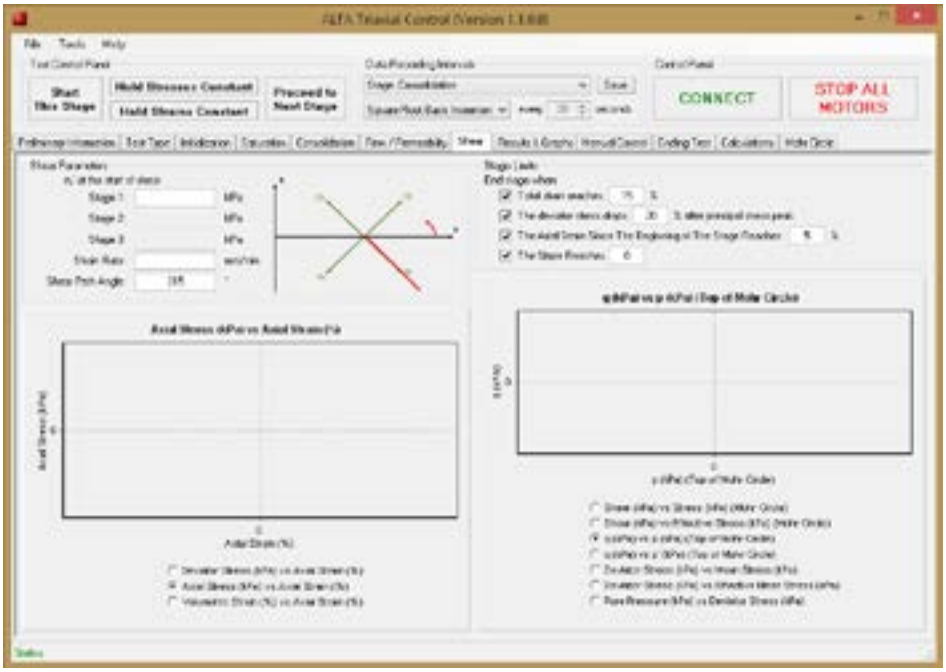
TRIAXIAL SOFTWARE : Shear Tab



Shear Parameters:

- Displays the target pressure for each stage and gives the ability to draw any custom path for the sample. The strain rate is also specified in this section.

Stage Limits:

- Gives the option to end the test with any desired limitations..

Graphs:

- Mohr Circle graphs and calculations
- q vs p
- q vs p'
- Deviator stress vs mean stress
- Pore pressure vs deviator stress

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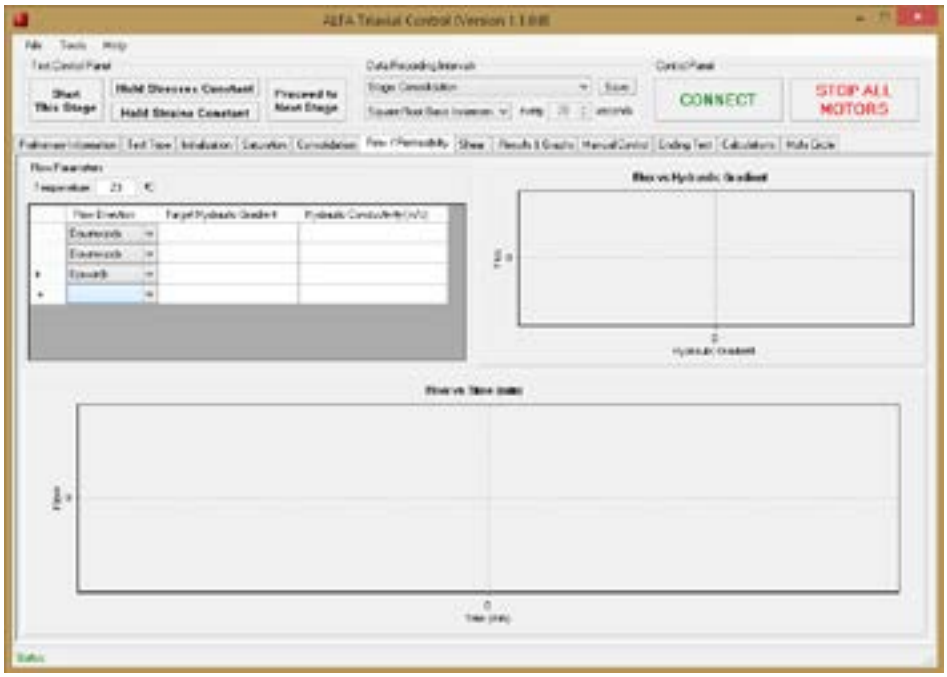
TRIAXIAL SOFTWARE : Flow/Permeability Tab



Flow Parameters:

- Displays the target pressure for each stage and gives the ability to draw any custom path for the sample. The strain rate is also specified in this section.

Graphs:

- Flow vs time
- Flux vs hydraulic gradient

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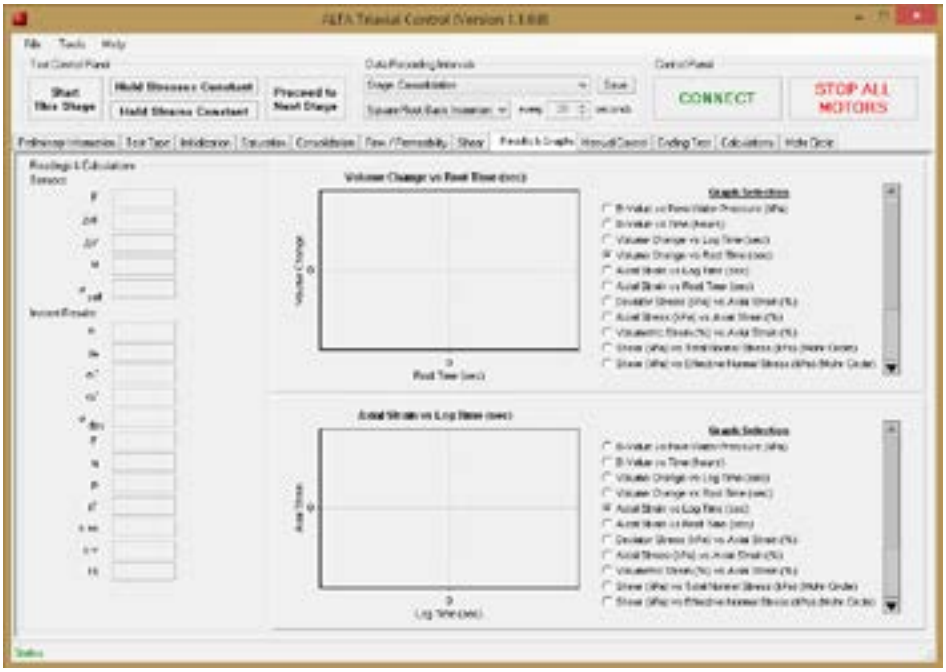
TRIAXIAL SOFTWARE : Results & Graphs Tab



Readings and Calculations:

- Shows the readings from all the sensors and the calculated values for each parameter simultaneously.

Graphs:

- B-Value vs Pore Water Pressure (kPa)
- a-Value vs Time (hours)
- Volume Change vs Log Time (sec)
- Volume Change vs Root Time (sec)
- Axial Strain vs Log Time (sec)
- Axial Strain vs Root Time (sec)
- Deviator Stress (kPa) vs Axial Strain
- Axial Stress (kPa) vs Axial Strain
- Volumetric Strain vs Axial Strain
- Shear (kPa) vs Total Normal Stress (kPa) (Mohr Circle)
- Shear (kPa) vs Effective Normal Stress (kPa) (Mohr Circle)
- q (kPa) vs p (kPa) (Top of Mohr Circle)
- q (kPa) vs p' (kPa) (Top of Mohr Circle)
- Deviator Stress (kPa) vs Mean Stress (kPa)
- Deviator Stress (kPa) vs Effective Mean Stress (kPa)
- Pore Pressure (kPa) vs Deviator Stress (kPa)

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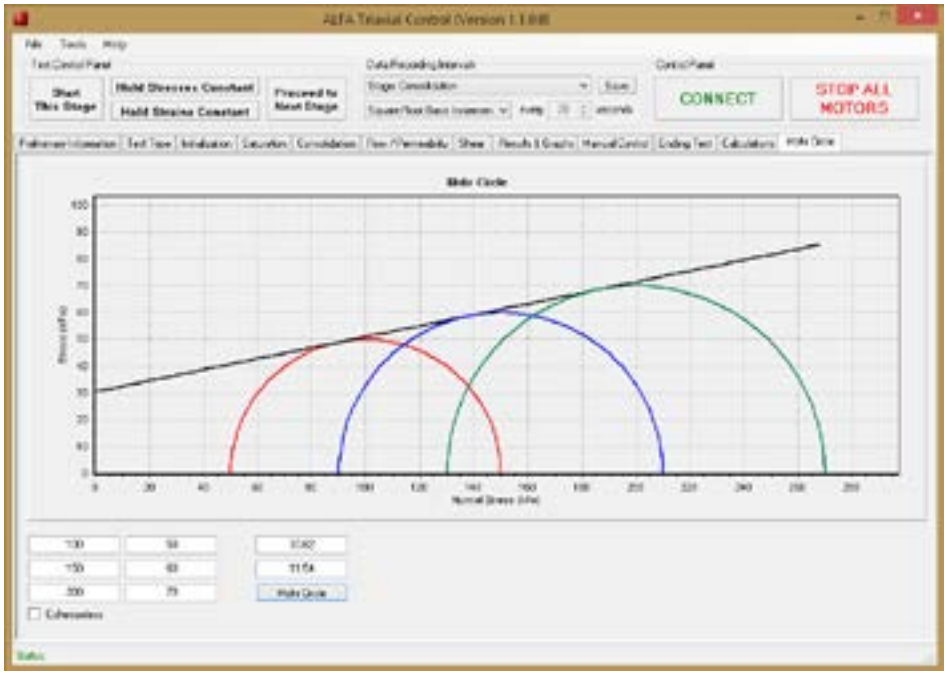
TRIAXIAL SOFTWARE : Mohr Circle Tab



Mohr Circle

- The software allows the user to combine and compare tests from different samples together in one single report, draw the corresponding mohr circles and calculate the related soil characteristics.

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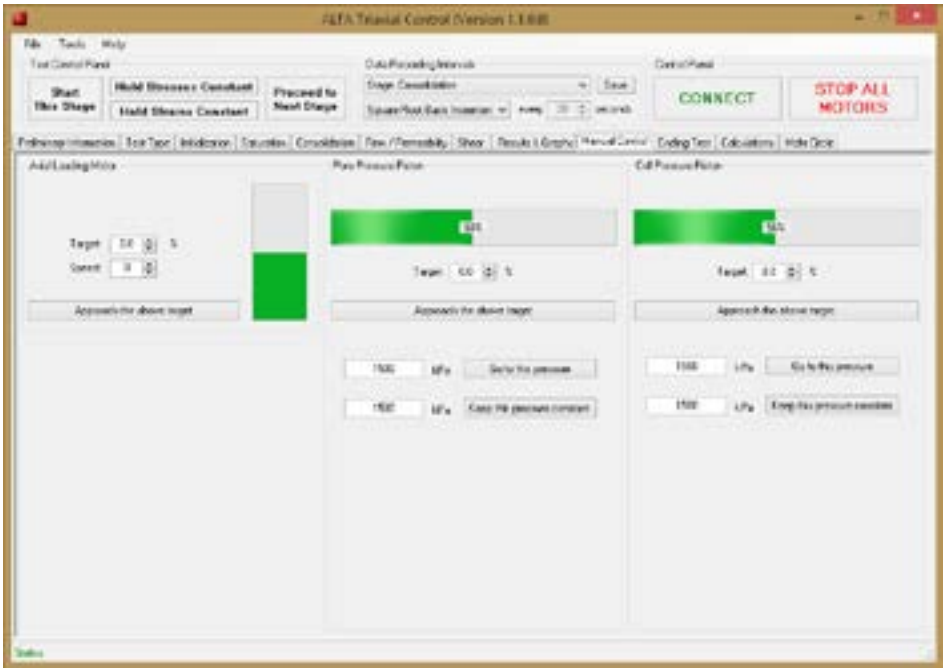
TRIAXIAL SOFTWARE : Manual Control Tab

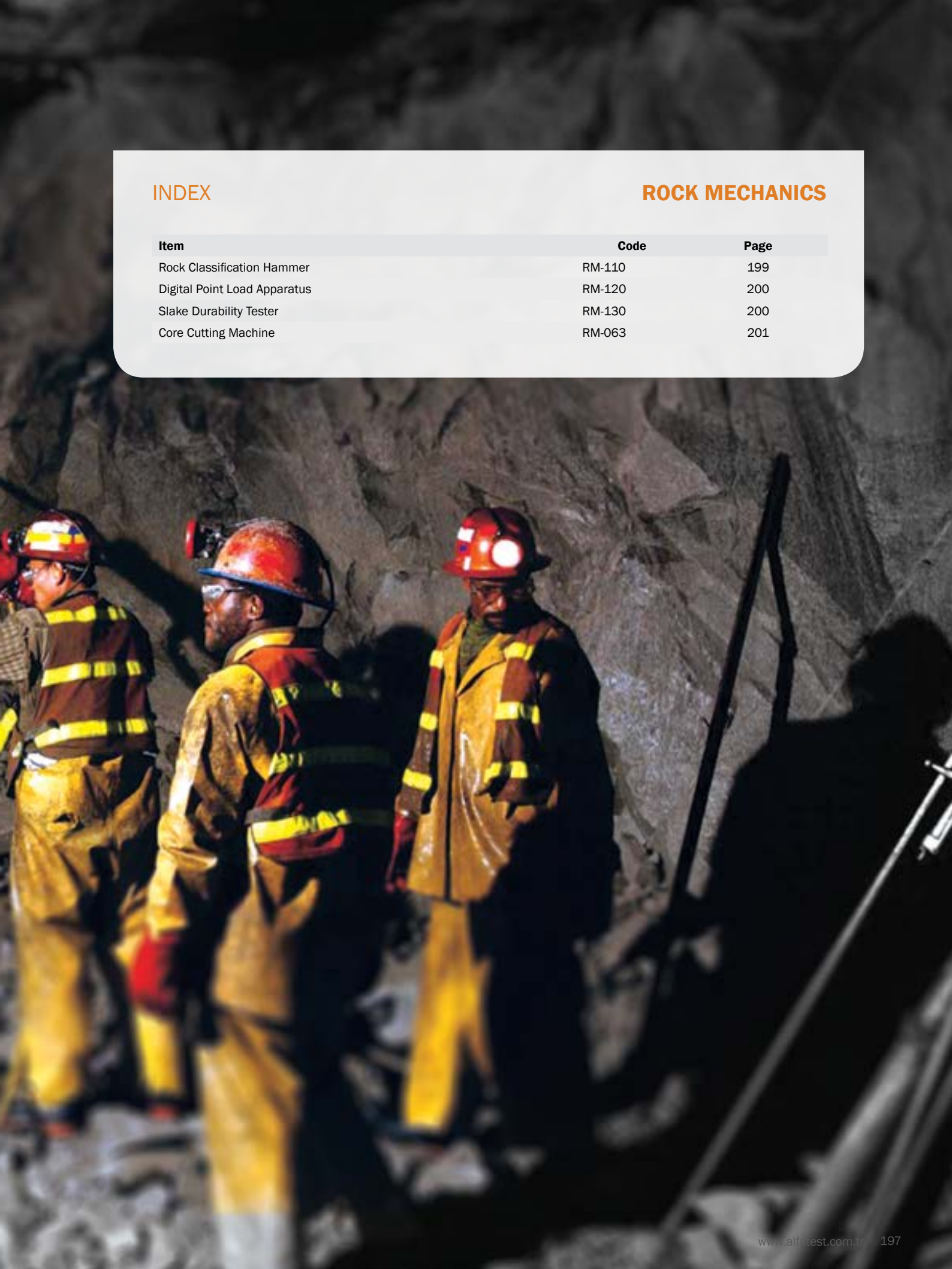


- Provides manual control on each motor/PVA.

Ending Test Tab:

- Gives instructions on how to end the test properly and empty the cell from water ... etc.

ROCK MECHANICS



ROCK CLASSIFICATION HAMMER (RM-110)

- Used to determine the rock classification.
- The impact energy of the equipment is 0.74 Nm
- The core that is going to be tested is placed horizontally and the impact is applied on it.
- Supplied with a carrying case.
- Rock Cradle should be ordered separately.

Rock Classification Hammer (RM-110)

SUPPLIED WITH

- Carrying Case

TECHNICAL SPECIFICATIONS

- Similar to Concrete Test Hammer
- Impact Energy : 0.74 Nm
- Core is positioned horizontally

Code	Dimensions (± 1 cm)	Approximate Weight (kg)
RM-110	35 x 18 x 16 (h)	2

DIGITAL POINT LOAD APPARATUS (RM-120)

- Used to determine the strength value of the rock specimens either in the field or in the laboratory.
- Designed to be light and easily ported from place to another.
- Consists of two-column crosshead frame and a hand operated hydraulic jack, and the load is measured by a pressure transducer with a digital display unit.
- The samples to be tested do not need to be regular in shape since the equipment can perform the test on irregular specimens too.
- Equipped with a digital indicator to measure the result.
- Provided with manual-hydraulic loading.

TECHNICAL SPECIFICATIONS

- Light and portable
- Can test irregular shaped samples
- Digital indicator
- Manual - Hydraulic Loading

Digital Point Load Apparatus (RM-120)

Code	Dimensions (± 1 cm)	Approximate Weight (kg)
RM-120	27 x 33 x 70 (h)	60

SLAKE DURABILITY TESTER (RM-130)

- Used to determine the durability of the rock specimens to weakening and disintegrating when subjected to the climatic slaking effects.
- Equipped with a motorized drive unit that rotates two drums. Drums rotate at 20 rpm inside acrylic water tank.
- The drums are made of stainless steel mesh.

TECHNICAL SPECIFICATIONS

Slake Durability (RM-130)

- Motorized Drive Unit
- Rotates 2 drums
- Rotates at 20 rpm
- Acrylic Water Tank
- Drums of Stainless Steel Mesh
- Drum Size : Ø 140 mm x 100 mm
- Power Supply: 220 - 240 V / 50 or 60 Hz (110 V / 60 Hz is also available)

CORE CUTTING MACHINE (RM-063)

- Used to cut core samples.
- Equipped with a disc holder for a maximum diameter of 230 mm.
- The distance of the disc is adjustable according to the user's needs.
- Supplied with a water pump for cooling the materials while cutting.

Core Cutting Machine (RM-063)

TECHNICAL SPECIFICATIONS

- Used for cutting core samples.
- Disc diameter: Maximum 230 mm.
- Supplied with water pump for cooling.
- Power Supply: 220 - 240 V / 50 or 60 Hz (110 V / 60 Hz is also available)

Code	Dimensions (± 1 cm)	Approximate Weight (kg)
RM-063	110 x 65 x 125 (h)	57